

Interactive comment on “Influence of atmospheric conditions on the role of trifluoroacetic acid in atmospheric sulfuric acid-dimethylamine nucleation” by Ling Liu et al.

Anonymous Referee #2

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The Study of Liu et al. report the influence of atmospheric conditions on the role of a perfluorocarboxylic acid, namely trifluoroacetic acid (TFA) in sulfate-based aerosol formation. This study readily complements a previous study from the same authors (Lu et al. 2020) by extending the local atmospheric conditions to worldwide atmospheric conditions. They used density functional theory and dynamics simulation to show that the particle formation rate and the contributions of sulfuric acid – dimethylamine – TFA clusters to the cluster formation pathways can be effectively enhanced, especially in cold and mildly polluted regions. This study highlights the influence of the use of Freon alternatives on air quality and climate, and is of great interest for researchers in various fields within atmospheric and aerosol sciences. The study is well conducted and the

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approach is sound. I recommend publication in Atmospheric Chemistry and Physics after the comments below have been addressed.

The referee comments are provided as a supplement.

Please also note the supplement to this comment:

<https://acp.copernicus.org/preprints/acp-2020-1186/acp-2020-1186-RC2-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-1186>, 2020.

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